

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Carlo Liberale et al.

Application No.: 10/586,205

Filed: July 13, 2006

For: ACTUATOR FOR THE
ACTUATION OF SUBMARINE
DEVICES

§ Group Art Unit: 3753

§ Confirmation No.: 4778

§ Examiner: Schneider, Craig M.

§ Atty. Docket: CMRN:0006/SWA/SIN
§ CCV/Dresser 030957 US

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APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 41.31 AND 41.37

This Appeal Brief is being filed in furtherance to the Notice of Appeal electronically filed on August 3, 2011.

The Commissioner is authorized to charge the requisite fee of \$620.00 for this Appeal Brief, and any additional fees which may be required, to Deposit Account No. 03-0335; Order No. CCV/Dresser 030957 US (CMRN:0006/SWA).

1. REAL PARTY IN INTEREST

The real party in interest is Cameron International Corporation, the Assignee of the above-referenced application by virtue of the Assignment executed by Carlo Liberale and Fabio Imperiali, as Inventors, recorded at reel 024584, frame 0485, and dated June 23, 2010. Accordingly, Cameron International Corporation, as Assignee of the above-referenced application, will be directly affected by the Board's decision in the pending appeal.

2. RELATED APPEALS AND INTERFERENCES

Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellants' legal representative in this Appeal.

3. STATUS OF CLAIMS

Claims 10, 12-16, 18-22, 24-32 are currently pending and under final rejection and, thus, are the subject of this Appeal. Claims 1-9, 11, 17, 23, and 33-35 have previously been canceled by Appellants.

4. STATUS OF AMENDMENTS

In an amendment and response to the Final Office Action filed on August 2, 2011, Appellants amended independent claims 10, 20, and 27, and canceled dependent claims 33-35. More specifically, the subject matter previously recited by dependent claims 33-35 was incorporated into independent claims 10, 20, and 27, respectively. In an Advisory Action mailed August 12, 2011, the Examiner acknowledged that these amendments were entered, and that these amendments overcome a rejection of claims 10, 12-16, 18-22, and 24-26 under 35 U.S.C. § 112, first paragraph, thereby reducing the number of issues for appeal.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The Application contains three independent claims, namely, claims 10, 20, and 27, all of which are the subject of this Appeal. The subject matter of these claims is summarized below.

Claims 10, 20, and 27 all generally relate to an actuator for the actuation of submarine devices, such as valves for closing and opening submarine ducts. *See, e.g.*, Application, page 1, lines 4-6. The actuators may be actuated using electric motors controlled by a remote control station. *See, e.g., id.* at page 3, lines 11-18.

With regard to the aspect of the invention set forth in independent claim 10, discussions of the recited features of claim 10 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with claim 10 provides a system including a submersible actuator. *See, e.g., id.* at page 5, lines 5-19; Figures 1-4. The submersible actuator includes a first housing (*e.g.*, 2) having an electric motor (*e.g.*, 21, 22) disposed in a first pressurized fluid. *See, e.g., id.* at page 5, lines 12-16; page 6, line 1 – page 7, line 6; Figures 1-4. The first pressurized fluid is a pressurized lubricating liquid. *See, e.g., id.* at page 6, lines 23-25. The submersible actuator also includes a second housing (*e.g.*, 3) having a control circuit (*e.g.*, 31, 32) disposed in a second pressurized fluid. *See, e.g., id.* at page 5, lines 12-16; page 7, line 16 – page 8, line 5; Figures 1-5. The second pressurized fluid is nitrogen. *See, e.g., id.* at page 7, lines 16-19. The control circuit (*e.g.*, 31, 32) is coupled to the electric motor (*e.g.*, 21, 22), and is configured to communicate with a remote control station. *See, e.g., id.* at page 8, line 22 – page 12, line 22; Figures 4 and 5.

With regard to the aspect of the invention set forth in independent claim 20, discussions of the recited features of claim 20 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with claim 20 provides a method that includes pneumatically pressurizing a control circuit (*e.g.*, 31, 32) in a first enclosure portion (*e.g.*, 3) of a submersible actuator.

See, e.g., id. at page 5, lines 12-16; page 7, line 16 – page 8, line 5; Figures 1-5. Pneumatically pressurizing comprises inertly pressurizing the control circuit (e.g., 31, 32) in the first enclosure portion (e.g., 3) with pressurized nitrogen. *See, e.g., id.* at page 7, lines 16-19. The method also includes hydraulically pressurizing at least one electric motor (e.g., 21, 22) in a second enclosure portion (e.g., 2) of the submersible actuator. *See, e.g., id.* at page 5, lines 12-16; page 6, line 1 – page 7, line 6; Figures 1-4. The control circuit (e.g., 31, 32) is coupled to the at least one electric motor (e.g., 21, 22). *See, e.g., id.* at page 8, line 22 – page 12, line 22; Figures 4 and 5.

With regard to the aspect of the invention set forth in independent claim 27, discussions of the recited features of claim 27 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with claim 27 provides a system including a submersible actuator. The submersible actuator includes a first container (e.g., 2) filled with a liquid. *See, e.g., id.* at page 5, lines 12-16; page 6, line 1 – page 7, line 6; Figures 1-4. The submersible actuator also includes a second container (e.g., 3) filled with nitrogen. *See, e.g., id.* at page 5, lines 12-16; page 7, line 16 – page 8, line 5; Figures 1-5. The submersible actuator further includes an electric motor (e.g., 21, 22) disposed in the first container (e.g., 2). *See, e.g., id.* at page 6, line 1 – page 7, line 6; Figures 1-4. In addition, the submersible actuator includes a control circuit (e.g., 31, 32) disposed in the second container (e.g., 3). *See, e.g., id.* at page 7, line 16 – page 8, line 5; Figures 1-5. The control circuit (e.g., 31, 32) is configured to control the electric motor (e.g., 21, 22) to actuate a submarine device. *See, e.g., id.* at page 8, line 22 – page 12, line 22; Figures 4 and 5.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

First Ground of Rejection for Review on Appeal:

The Examiner rejected claims 24 and 30 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

Second Ground of Rejection for Review on Appeal:

The Examiner rejected claims 10, 12, 14, 16, 18-22, 24-27, and 29-32 under 35 U.S.C. § 103(a) as being unpatentable over Johansen et al. (U.S. Patent No. 6,595,487) in view of Dalton, Jr. (U.S. Patent No. 4,774,383), Wallace (U.S. Patent Application Publication No. 2005/0016769), and Birtcher et al. (U.S. Patent Application Publication No. 2003/0131885).

Third Ground of Rejection for Review on Appeal:

The Examiner rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher and further in view of Ursel et al. (WO 01/99259).

Fourth Ground of Rejection for Review on Appeal:

The Examiner rejected claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher and further in view of Schoenberg (U.S. Patent No. 5,166,677) and Andre (U.S. Patent No. 4,902,030).

Fifth Ground of Rejection for Review on Appeal:

The Examiner rejected claim 28 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher and further in view of Ursel.

7. ARGUMENT

As discussed in detail below, the Examiner has improperly rejected the pending claims. Further, the Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under 35 U.S.C. § 112, first paragraph, and 35 U.S.C. § 103. Accordingly, Appellants respectfully request full and favorable consideration by the Board, as Appellants strongly believe that claims 10, 12-16, 18-22, 24-32 are currently in condition for allowance.

A. **Ground of Rejection No. 1:**

As discussed above, the Examiner rejected claims 24 and 30 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement.

Legal Precedent Regarding Section 112, First Paragraph Rejections

Regarding the written description requirement, the initial burden of proof regarding the sufficiency of the written description falls on the Examiner. *See In re Wertheim*, 541 F.2d 257, 263, 191 U.S.P.Q. 90, 97 (C.C.P.A. 1976); *see M.P.E.P. § 2163.04*. Accordingly, the Examiner must present evidence or reasons why persons skilled in the art would not recognize a description of the claimed subject matter in the applicant's disclosure. *Id.* 541 F.2d at 262, 191 U.S.P.Q. at 96. An objective standard for determining compliance with the written description requirement is, "does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 U.S.P.Q.2d 1614, 1618 (Fed. Cir. 1989); *M.P.E.P. § 2163.02*. The Examiner should review the claims and the entire specification, including the specific embodiments, figures, and sequence listings, to understand how applicant provides support for the various features of the claimed invention. *See M.P.E.P. § 2163, II, A, 2*. The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement. *See M.P.E.P. § 2163.02*. In other words, the written description requirement does not require the claims to recite the same terminology used in the disclosure. The patentee may be his own lexicographer. *Ellipse Corp. v. Ford Motor Co.*, 171 U.S.P.Q. 513 (7th Cir. 1971), *aff'd* 613 F.2d 775 (7th Cir. 1979), *cert. denied*, 446 U.S. 939 (1980). The absence of definitions or details for well-established terms or procedures should not be the basis of a rejection under 35 U.S.C. § 112, first paragraph, for lack of adequate written description. *See M.P.E.P. § 2163, II, A, 1*. Information which is well known in the art need not be described in detail in the specification. *See Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379-

80, 231 U.S.P.Q. 81, 90 (Fed. Cir. 1986); *see* M.P.E.P. § 2163, II, A, 2. By disclosing in a patent application a device that inherently performs a function or has a property, operates according to a theory or has an advantage, a patent application necessarily discloses that function, theory or advantage, even though it says nothing explicit concerning it. *See* M.P.E.P. § 2163.07(a). Moreover, any information contained in any part of the application as filed, including the specification, claims and drawings, may be added to other portions of the application without introducing new matter. Accordingly, if an application as originally filed contains a claim disclosing material not disclosed in the remainder of the specification, the applicant may amend the specification to include the claimed subject matter. *In re Benno*, 768 F.2d 1340, 226 U.S.P.Q. 683 (Fed. Cir. 1985).

Claims 24 and 30

In the Final Office Action, with respect to claim 24, the Examiner stated that the “originally filed specification does not have support for controlling the submersible actuator based on a target position, feedback, and historical data associated with the submersible actuator.” *See id.* Similarly, with respect to claim 30, the Examiner stated that the “originally filed specification does not have support for wherein the control circuit is configured to control, [sic] the electric motor based on historical data associated with the actuation of the submarine device.” *See id.* at page 3. As such, it appears that the Examiner is of the opinion that the specification does not include support for controlling actuation based on: (1) a target position, (2) feedback, or (3) historical data. However, the specification as originally filed includes support for controlling actuation based on each of: (1) a target position, (2) feedback, and (3) historical data.

For example, the specification as originally filed states that “the processing consists of calculating a speed value and direction SP for the rotation of the motor starting from the position value of the valve to be reached SETP (open/closed) and from the current position of the valve POSA and sending a corresponding signal to the pilot circuit of the motor.” *See* Application, page 11, lines 2-8 (emphasis added). One skilled

in the art would understand that a position value of a valve to be reached is a “target position.” In addition, the specification as originally filed clearly includes detailed discussion on “feedback” used to control the actuator. *See, e.g., id.* at page 8, line 22 – page 12, line 22; FIG. 5. Furthermore, the specification as originally filed states that “the filtered control signal SCF is obtained, having memorised a predetermined number N of prior input commands SCP from which an average MCP (average of previous commands) has been worked out.” *See id.* at page 9, lines 20-23 (emphasis added). One skilled in the art would understand that a memorized predetermined number of prior input commands constitutes “historical data.”

As such, the specification as originally filed includes support for controlling actuation based on each of: (1) a target position, (2) feedback, and (3) historical data. Accordingly, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 112, first paragraph, of claims 24 and 30.

B. Ground of Rejection No. 2:

As discussed above, the Examiner rejected claims 10, 12, 14, 16, 18-22, 24-27, and 29-32 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher.

Legal Precedent Regarding Section 103 Obviousness Rejections

Before continuing, Appellants note that this present ground of rejection, as well as all the subsequent remaining grounds of rejection, is based on Section 103. Accordingly, the following legal guidelines are equally applicable to each ground of rejection under Section 103. Therefore, to avoid redundancy, Appellants have not reproduced the following text for each subsequent discussion of the different grounds of rejection under Section 103.

With this in mind, the pending claims must be given an interpretation that is reasonable and consistent with the *specification*. *See In re Prater*, 415 F.2d 1393, 1404-

05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969) (emphasis added); *see also In re Morris*, 127 F.3d 1048, 1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); *see also* M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is “the primary basis for construing the claims.” *See Phillips v. AWH Corp.*, No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. *See id.*

Interpretation of the claims must also be consistent with the interpretation that *one of ordinary skill in the art* would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. “The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.” *See Collegenet, Inc. v. ApplyYourself, Inc.*, 418 F.3d 1225, 75 U.S.P.Q.2d 1733, 1738 (Fed. Cir. 2005) (quoting *Phillips v. AWH Corp.*, 75 U.S.P.Q.2d 1321, 1326). The Federal Circuit has made clear that derivation of a claim term must be based on “usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art.” *See id.*

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). In addressing obviousness determinations under 35 U.S.C. § 103, the Supreme Court in *KSR International Co. v. Teleflex Inc.*, No. 04-1350 (April 30, 2007), reaffirmed many of its precedents relating to obviousness including its holding in *Graham v. John Deere Co.*, 383 U.S. 1 (1966). In *Graham*, the Court set out an objective analysis for applying the statutory language of § 103:

Under §103, the scope and content of the prior art are to be determined, differences between the prior art and the claims at issue are to be ascertained, and the level of ordinary skill in the pertinent art are to be resolved. Against this background the obviousness or non-obviousness of the subject matter is to be determined. Such secondary considerations as commercial success, long-felt but unresolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin

of the subject matter sought to be patented. *KSR*, *slip op.* at 2 (citing *Graham*, 383 U.S. at 17-18).

In *KSR*, the Court also reaffirmed that “a patent composed of several elements is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* at 14. In this regard, the *KSR* court stated that “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does ... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known.” *Id.* at 14-15. Traditionally, to establish a *prima facie* case of obviousness, the CCPA and the Federal Circuit have required that the prior art not only include all of the claimed elements, but also some teaching, suggestion, or motivation to combine the known elements in the same manner set forth in the claim at issue. *See, e.g., ASC Hospital Systems Inc. v. Montefiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (holding that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination.); *In re Mills*, 16 U.S.P.Q.2d 1430, 1433 (Fed. Cir. 1990) (holding that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination). In *KSR*, the court noted that the demonstration of a teaching, suggestion, or motivation to combine provides a “helpful insight” in determining whether claimed subject matter is obvious. *KSR*, *slip op.* at 14. However, the court rejected a *rigid* application of the “TSM” test. *Id.* at 11. In this regard, the court stated:

The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and explicit content of issued patents. The diversity of inventive pursuit and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it

often may be the case that market demand, rather than scientific literature, will drive design trends. *Id.* at 15.

In other words, the *KSR* court rejected a rigid application of the TSM test which requires that a teaching, suggestion or motivation to combine elements in a particular manner must be explicitly found in the cited prior art. Instead, the *KSR* court favored a more expansive view of the sources of evidence that may be considered in determining an apparent reason to combine known elements by stating:

Often, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art all in order to determine whether there was an apparent reason to combine in the known elements in the fashion claimed in the patent at issue. *Id.* at 14.

The *KSR* court also noted that there is not necessarily an inconsistency between the idea underlying the TSM test and the *Graham* analysis, and it further stated that the broader application of the TSM test found in certain Federal Circuit decisions appears to be consistent with *Graham*. *Id.* at 17-18 (citing *DyStar Textilfarben GmbH and Co. v. C.H. Patrick Co.*, 464 F.3d 1356, 1367 (2006) (“Our suggestion test is in actuality quite flexible and not only permits but *requires* consideration of common knowledge and common sense”); *Alza Corp. v. Mylan Labs, Inc.*, 464 F.3d 1286, 1291 (2006) (“There is flexibility in our obviousness jurisprudence because a motivation may be found *implicitly* in the prior art. We do not have a rigid test that requires a teaching to combine ... “)).

Furthermore, the *KSR* court did not diminish the requirement for objective evidence of obviousness. *Id.* at 14 (“To facilitate review, this analysis should be made explicit. See *In re Kahn*, 441 F.3d 977, 988 (CA Fed. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”). As our precedents make clear, however, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged

claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ."); *see also, In re Lee*, 61 U.S.P.Q.2d 1430, 1436 (Fed. Cir. 2002) (holding that the factual inquiry whether to combine references must be thorough and searching, and that it must be based on *objective evidence of record*).

When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988). The Federal Circuit has warned that the Examiner must not, "fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher." *In re Dembicza*, F.3d 994, 999, 50 U.S.P.Q.2d 52 (Fed. Cir. 1999) (quoting *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1553, 220 U.S.P.Q. 303, 313 (Fed. Cir. 1983)).

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983); M.P.E.P. § 2145. Moreover, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959); *see* M.P.E.P. § 2143.01(VI). If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984); *see* M.P.E.P. § 2143.01(V).

Non-analogous art cannot properly be pertinent prior art under 35 U.S.C. § 103. *In re Pagliaro*, 210 U.S.P.Q. 888, 892 (C.C.P.A. 1981). For the teachings of a reference to be prior art under 35 U.S.C. § 103, there must be some basis for concluding that the reference would have been considered by one skilled in the particular art working on the particular problem with which the invention pertains. *In re Horne*, 203 U.S.P.Q. 969, 971 (C.C.P.A. 1979). The determination of whether a reference is from a non-analogous art is set forth in a two-step test given in *Union Carbide Corp. v. American Can Co.*, 724 F.2d 1567, 220 U.S.P.Q. 584 (Fed. Cir. 1984). In *Union Carbide*, the court found that the first determination was whether “the reference is within the field of the inventor’s endeavor.” If it is not, one must proceed to the second step “to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved.” In regard to the second step, *Bott v. Fourstar Corp.*, 218 U.S.P.Q. 358 (E.D. Mich. 1983) determined that “analogous art is that field of art which a person of ordinary skill in the art would have been apt to refer in attempting to solve the problem solved by a proposed invention.” “To be relevant the area of art should be where one of ordinary skill in the art would be aware that similar problems exist.” *Id.*

The Cited References are Missing Features Recited by Independent Claim 10

Independent claim 10 recites, *inter alia*, “a submersible actuator, comprising: a first housing having an electric motor disposed in a first pressurized fluid, wherein the first pressurized fluid is a pressurized lubricating liquid; and a second housing having a control circuit disposed in a second pressurized fluid, wherein the second pressurized fluid is nitrogen.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a housing having a control circuit disposed in a pressurized fluid, wherein the pressurized fluid is pressurized nitrogen, as recited by independent claim 10. Indeed, the Examiner acknowledged that “Johansen et al. fail to disclose that the control circuit is disposed in a second pressurized fluid, wherein the second pressurized fluid is an inert gas.” *See* Final Office Action, page 3. Rather, the

Examiner relied upon Birtcher as disclosing “the use of nitrogen in an electronics box in order to provide an inert atmosphere.” *See id.* at page 4. However, Appellants note that Birtcher merely discloses the use of directing nitrogen into an electronics box of a semiconductor fabrication apparatus. *See, e.g.*, Birtcher, paragraph [0081]. As such, Birtcher clearly does not disclose a submersible actuator including a housing having a control circuit disposed in pressurized fluid, wherein the pressurized fluid is pressurized nitrogen, as recited by independent claim 10.

In the Final Office Action, the Examiner contended that it “would have further been obvious to one of ordinary skill in the art at the time the invention was made to utilize an inert atmosphere in the electronics area as taught by Birtcher et al. for the atmosphere of the second housing of Johansen et al. in combination with Dalton, Jr. and Wallace, in order to provide an explosion proof atmosphere in the second housing as taught by Birtcher et al. and to further provide an atmosphere that will not damage the electronic circuitry.” *See* Final Office Action, page 4. However, it would not at all have been obvious to combine the process of inserting low pressure nitrogen into the electronics box of the semiconductor fabrication apparatus of Birtcher with the submersible actuator of the present claims. For example, the generally atmospheric environment of the semiconductor fabrication apparatus of Birtcher is drastically different than an underwater environment (e.g., submersible) as recited by independent claim 10. An underwater environment, such as a subsea environment, may be particularly detrimental to sensitive electronics, and is also at a significant pressure. Thus, pressurized nitrogen in an underwater environment would provide the additional benefit of counterbalancing the pressure of the water. In addition, because of the remote nature of the submersible actuator, directing nitrogen into a subsea housing in the manner described in Birtcher would not be feasible.

Further, Birtcher is non-analogous art in view of the *Union Carbide* test set forth above. With regard to the first step in the *Union Carbide* two-step test, Appellants reiterate that the present application is directed to a submersible actuator. In contrast,

Birtcher is directed to a semiconductor fabrication apparatus. Accordingly, Birtcher is certainly not within the field of the inventor's endeavor. In regard to the second step of the *Union Carbide* test, Appellants assert that the disclosure of Birtcher is not reasonably pertinent to the particular problem the inventor was involved (i.e., pressurizing a container filled with nitrogen in a corrosive, high-pressure underwater environment). Indeed, Birtcher is merely directed toward filling an electronics box with relatively low-pressure nitrogen. Thus, Birtcher is non-analogous art, and the Examiner improperly cited Birtcher.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a housing having a control circuit disposed in a pressurized fluid, wherein the pressurized fluid is pressurized nitrogen, as recited by independent claim 10. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of independent claim 10 and the claims depending therefrom.

The Cited References are Missing Features Recited by Independent Claim 20

Independent claim 20 recites, *inter alia*, "pneumatically pressurizing a control circuit in a first enclosure portion of a submersible actuator, wherein pneumatically pressurizing comprises inertly pressurizing the control circuit in the first enclosure portion with pressurized nitrogen." (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest pneumatically pressurizing a control circuit in a first enclosure portion of a submersible actuator by inertly pressurizing the control circuit in the first enclosure portion with pressurized nitrogen, as recited by independent claim 20. Indeed, the Examiner acknowledged that "Johansen et al. fail to disclose that the control circuit is disposed in a second pressurized fluid, wherein the second pressurized fluid is an inert gas." *See* Final Office Action, page 3. Rather, the Examiner relied upon Birtcher as disclosing "the use of nitrogen in an electronics box in order to provide an inert

atmosphere.” *See id.* at page 4. However, Appellants note that Birtcher merely discloses the use of directing nitrogen into an electronics box of a semiconductor fabrication apparatus. *See, e.g.*, Birtcher, paragraph [0081]. As such, Birtcher clearly does not disclose pneumatically pressurizing a control circuit in a first enclosure portion of a submersible actuator by inertly pressurizing the control circuit in the first enclosure portion with pressurized nitrogen, as recited by independent claim 20.

In the Final Office Action, the Examiner contended that it “would have further been obvious to one of ordinary skill in the art at the time the invention was made to utilize an inert atmosphere in the electronics area as taught by Birtcher et al. for the atmosphere of the second housing of Johansen et al. in combination with Dalton, Jr. and Wallace, in order to provide an explosion proof atmosphere in the second housing as taught by Birtcher et al. and to further provide an atmosphere that will not damage the electronic circuitry.” *See* Final Office Action, page 4. However, it would not at all have been obvious to combine the process of inserting low pressure nitrogen into the electronics box of the semiconductor fabrication apparatus of Birtcher with the submersible actuator of the present claims. For example, the generally atmospheric environment of the semiconductor fabrication apparatus of Birtcher is drastically different than an underwater environment (e.g., submersible) as recited by independent claim 20. An underwater environment, such as a subsea environment, may be particularly detrimental to sensitive electronics, and is also at a significant pressure. Thus, pressurized nitrogen in an underwater environment would provide the additional benefit of counterbalancing the pressure of the water. In addition, because of the remote nature of the submersible actuator, directing nitrogen into a subsea enclosure in the manner described in Birtcher would not be feasible.

Further, Birtcher is non-analogous art in view of the *Union Carbide* test set forth above. With regard to the first step in the *Union Carbide* two-step test, Appellants reiterate that the present application is directed to a submersible actuator. In contrast, Birtcher is directed to a semiconductor fabrication apparatus. Accordingly, Birtcher is

certainly not within the field of the inventor's endeavor. In regard to the second step of the *Union Carbide* test, Appellants assert that the disclosure of Birtcher is not reasonably pertinent to the particular problem the inventor was involved (i.e., pressurizing a container filled with nitrogen in a corrosive, high-pressure underwater environment). Indeed, Birtcher is merely directed toward filling an electronics box with relatively low-pressure nitrogen. Thus, Birtcher is non-analogous art, and the Examiner improperly cited Birtcher.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest pneumatically pressurizing a control circuit in a first enclosure portion of a submersible actuator by inertly pressurizing the control circuit in the first enclosure portion with pressurized nitrogen, as recited by independent claim 20. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of independent claim 20 and the claims depending therefrom.

The Cited References are Missing Features Recited by Independent Claim 27

Independent claim 27 recites, *inter alia*, “a submersible actuator, comprising: ... a second container filled with nitrogen ... and a control circuit disposed in the second container.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a container having a control circuit and filled with nitrogen, as recited by independent claim 27. Indeed, the Examiner acknowledged that “Johansen et al. fail to disclose that the control circuit is disposed in a second pressurized fluid, wherein the second pressurized fluid is an inert gas.” *See* Final Office Action, page 3. Rather, the Examiner relied upon Birtcher as disclosing “the use of nitrogen in an electronics box in order to provide an inert atmosphere.” *See id.* at page 4. However, Appellants note that Birtcher merely discloses the use of directing nitrogen into an electronics box of a semiconductor fabrication apparatus. *See, e.g.*, Birtcher,

paragraph [0081]. As such, Birtcher clearly does not disclose a submersible actuator including a container having a control circuit and filled with nitrogen, as recited by independent claim 27.

In the Final Office Action, the Examiner contended that it “would have further been obvious to one of ordinary skill in the art at the time the invention was made to utilize an inert atmosphere in the electronics area as taught by Birtcher et al. for the atmosphere of the second housing of Johansen et al. in combination with Dalton, Jr. and Wallace, in order to provide an explosion proof atmosphere in the second housing as taught by Birtcher et al. and to further provide an atmosphere that will not damage the electronic circuitry.” *See* Final Office Action, page 4. However, it would not at all have been obvious to combine the process of inserting low pressure nitrogen into the electronics box of the semiconductor fabrication apparatus of Birtcher with the submersible actuator of the present claims. For example, the generally atmospheric environment of the semiconductor fabrication apparatus of Birtcher is drastically different than an underwater environment (e.g., submersible) as recited by independent claim 27. An underwater environment, such as a subsea environment, may be particularly detrimental to sensitive electronics, and is also at a significant pressure. Thus, pressurized nitrogen in an underwater environment would provide the additional benefit of counterbalancing the pressure of the water. In addition, because of the remote nature of the submersible actuator, directing nitrogen into a subsea container in the manner described in Birtcher would not be feasible.

Further, Birtcher is non-analogous art in view of the *Union Carbide* test set forth above. With regard to the first step in the *Union Carbide* two-step test, Appellants reiterate that the present application is directed to a submersible actuator. In contrast, Birtcher is directed to a semiconductor fabrication apparatus. Accordingly, Birtcher is certainly not within the field of the inventor’s endeavor. In regard to the second step of the *Union Carbide* test, Appellants assert that the disclosure of Birtcher is not reasonably pertinent to the particular problem the inventor was involved (i.e., pressurizing a

container filled with nitrogen in a corrosive, high-pressure underwater environment). Indeed, Birtcher is merely directed toward filling an electronics box with relatively low-pressure nitrogen. Thus, Birtcher is non-analogous art, and the Examiner improperly cited Birtcher.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a container having a control circuit and filled with nitrogen, as recited by independent claim 27. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of independent claim 27 and the claims depending therefrom.

The Cited References are Missing Features Recited by Dependent Claim 14

Dependent claim 14 recites, *inter alia*, “the control circuit is configured to compare a value of a control signal with an average of a predetermined number of previous control signals.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “compare a value of a control signal with an average of a predetermined number of previous control signals,” as recited by dependent claim 14. Indeed, Appellants note that the Examiner has cited no passages in any of the references that teach or suggest such specific control circuit features. Rather, in rejecting dependent claim 14 in the Final Office Action, the Examiner merely stated that the “control circuit of Johansen et al. is capable of performing the functional limitations of claim. Further the control circuit as disclosed by Johansen et al. is capable of performing logic operations which would further lend to the capability of the control circuit to performing the intended use.” See Final Office Action, page 5. As such, it appears the Examiner has merely asserted that because Johansen discloses a control circuit, the control circuit is necessarily configured to perform the actions recited by dependent claim 14.

However, this assertion is clearly insufficient to support a *prima facie* case of obviousness. More specifically, Appellants note that it has been held that an “adapted to” clause may be a positive limitation where it “states a condition that is material to patentability.” *See Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 USPQ2d 1481, 1483 (Fed. Cir. 2005); *see also* M.P.E.P. § 2111.04. With respect to the features of the control circuit recited by dependent claim 14, the features are clearly material to the patentability of this claim, and therefore should be construed as positive limitations. As such, simply asserting that the control circuit of Johansen could be configured to perform the actions recited by dependent claim 14 does not support the assertion that the control circuit of Johansen is configured to perform the actions. Therefore, the Examiner has not met the burden required for a *prima facie* case of obviousness of dependent claim 14. Furthermore, Appellants have been unable to identify any passages within the cited references that teach or suggest a control circuit configured to perform the recited actions of comparing a value of a control signal with an average of a predetermined number of previous control signals.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “compare a value of a control signal with an average of a predetermined number of previous control signals,” as recited by dependent claim 14. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 14.

The Cited References are Missing Features Recited by Dependent Claims 16 and 31

Dependent claims 16 and 31 both recite, *inter alia*, “the control circuit is configured to control the electric motor based on feedback indicative of a current absorbed by the electric motor.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “control the electric motor based on feedback indicative of a current absorbed by the electric motor,” as recited by dependent claims 16 and 31. (Emphasis added.) Indeed, Appellants note that the Examiner has cited no passages in any of the references that teach or suggest such control circuit features. Rather, in rejecting dependent claim 16 in the Final Office Action, the Examiner merely stated that the “control circuit of Johansen et al. is capable of performing the functional limitations of claim. Further the control circuit as disclosed by Johansen et al. is capable of performing logic operations which would further lend to the capability of the control circuit to performing the intended use.” *See* Final Office Action, page 5. As such, it appears the Examiner has merely asserted that because Johansen discloses a control circuit, the control circuit is necessarily configured to perform the actions recited by dependent claims 16 and 31.

However, this assertion is clearly insufficient to support a *prima facie* case of obviousness. More specifically, Appellants note that it has been held that an “adapted to” clause may be a positive limitation where it “states a condition that is material to patentability.” *See Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 USPQ2d 1481, 1483 (Fed. Cir. 2005); *see also* M.P.E.P. § 2111.04. With respect to the features of the control circuit recited by dependent claims 16 and 31, the features are clearly material to the patentability of those claims, and therefore should be construed as positive limitations. As such, simply asserting that the control circuit of Johansen could be configured to perform the actions recited by dependent claims 16 and 31 does not support the assertion that the control circuit of Johansen is configured to perform the actions. Therefore, the Examiner has not met the burden required for a *prima facie* case of obviousness of dependent claims 16 and 31. Furthermore, Appellants have been unable to identify any passages within the cited references that teach or suggest a control circuit configured to perform the recited actions of controlling an electric motor based on feedback indicative of a current absorbed by the electric motor.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “control the electric motor based on feedback indicative of a current absorbed by the electric motor,” as recited by dependent claims 16 and 31. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claims 16 and 31.

The Cited References are Missing Features Recited by Dependent Claim 19

Dependent claim 19 recites, *inter alia*, “the control circuit is configured to control a speed value and a direction for rotation of the electric motor based on a target shaft position and a current shaft position sensed by a position sensor.”

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “control a speed value and a direction for rotation of the electric motor based on a target shaft position and a current shaft position sensed by a position sensor,” as recited by dependent claim 19. Indeed, Appellants note that the Examiner has cited no passages in any of the references that teach or suggest such specific control circuit features. Rather, in rejecting dependent claim 19 in the Final Office Action, the Examiner merely stated that the “control circuit of Johansen et al. is capable of performing the functional limitations of claim.” *See* Final Office Action, page 5. As such, it appears the Examiner has merely asserted that because Johansen discloses a control circuit, the control circuit is necessarily configured to perform the actions recited by dependent claim 19.

However, this assertion is clearly insufficient to support a *prima facie* case of obviousness. More specifically, Appellants note that it has been held that an “adapted to” clause may be a positive limitation where it “states a condition that is material to patentability.” *See Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 USPQ2d 1481, 1483 (Fed. Cir. 2005); *see also* M.P.E.P. § 2111.04. With respect to the features of the control circuit recited by dependent claim 19, the features are clearly material to the

patentability of this claim, and therefore should be construed as positive limitations. As such, simply asserting that the control circuit of Johansen could be configured to perform the actions recited by dependent claim 19 does not support the assertion that the control circuit of Johansen is configured to perform the actions. Therefore, the Examiner has not met the burden required for a *prima facie* case of obviousness of dependent claim 19.

Furthermore, Appellants have been unable to identify any passages within the cited references that teach or suggest a control circuit configured to perform the recited actions of controlling a speed value and a direction for rotation of the electric motor based on a target shaft position and a current shaft position sensed by a position sensor. Moreover, Appellants note that the Examiner has equated “moving or not moving of the valve” with “controlling a speed value” of an electric motor. *See* Final Office Action, page 5. However, Appellants contend that the fact that a valve is either moving or not moving cannot reasonably be interpreted as “controlling a speed value” of an electric motor. More specifically, the mere fact that a valve is moving or not does not define a controlled speed value of an electric motor that causes the valve to move.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “control a speed value and a direction for rotation of the electric motor based on a target shaft position and a current shaft position sensed by a position sensor,” as recited by dependent claim 19. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 19.

The Cited References are Missing Features Recited by Dependent Claim 24

Dependent claim 24 recites, *inter alia*, “controlling the submersible actuator based on a target position, feedback, and historical data associated with the submersible actuator.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest “controlling the submersible actuator based on a target position, feedback, and historical data associated with the submersible actuator,” as recited by dependent claim 24. (Emphasis added.) More specifically, Appellants note that the Examiner has equated the “last position the actuator moved the valve to” with “historical data” that may be used to control a submersible actuator. *See* Final Office Action, page 6. However, Appellants contend that the last position of a valve cannot reasonably be interpreted as “historical data associated with the submersible actuator” insofar as the term “historical data” (i.e., as opposed to the term “historical datum”) suggests that more than one item of information is used. Furthermore, there appears to be no suggestion in Johansen that a control circuit stores or otherwise is aware of the “last position the actuator moved the valve to,” much less that a control circuit uses this information to control a submersible actuator.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest “controlling the submersible actuator based on a target position, feedback, and historical data associated with the submersible actuator,” as recited by dependent claim 24. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 24.

The Cited References are Missing Features Recited by Dependent Claim 25

Dependent claim 25 recites, *inter alia*, “controlling a speed value and a direction for rotation of the at least one electric motor based on a target shaft position and a current shaft position sensed by a position sensor.”

The cited references, taken alone or in hypothetical combination, fail to teach or suggest “controlling a speed value and a direction for rotation of the at least one electric motor based on a target shaft position and a current shaft position sensed by a position sensor,” as recited by dependent claim 25. More specifically, Appellants note that the

Examiner has equated “moving or not moving” of a valve with “controlling a speed value” of an electric motor. *See* Final Office Action, page 6. However, Appellants contend that the fact that a valve is either moving or not moving cannot reasonably be interpreted as “controlling a speed value” of an electric motor. More specifically, the mere fact that a valve is moving or not does not define a controlled speed value of an electric motor that causes the valve to move.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “controlling a speed value and a direction for rotation of the at least one electric motor based on a target shaft position and a current shaft position sensed by a position sensor,” as recited by dependent claim 25. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 25.

The Cited References are Missing Features Recited by Dependent Claim 26

Dependent claim 26 recites, *inter alia*, “controlling the submersible actuator based on a first feedback indicative of an actuator position and a second feedback indicative of an absorbed current.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest “controlling the submersible actuator based on a first feedback indicative of an actuator position and a second feedback indicative of an absorbed current,” as recited by dependent claim 26. (Emphasis added.) More specifically, Appellants note that the Examiner has equated the “movement of the motor” with a “feedback indicative of absorbed current.” *See* Final Office Action, page 6. However, Appellants contend that the “movement of the motor” cannot reasonably be interpreted as “feedback indicative of absorbed current” (i.e., a current that is absorbed by an electric motor). *See* Application, page 11, lines 2-13.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest “controlling the submersible actuator based on a first feedback indicative of an actuator position and a second feedback indicative of an absorbed current,” as recited by dependent claim 26. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 26.

The Cited References are Missing Features Recited by Dependent Claim 29

Dependent claim 29 recites, *inter alia*, “the control circuit is configured to adjust a speed of the electric motor based on a current position and a target position of the submarine device.”

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “adjust a speed of the electric motor based on a current position and a target position of the submarine device,” as recited by dependent claim 29. Indeed, Appellants note that the Examiner has cited no passages in any of the references that teach or suggest such specific control circuit features. Rather, in rejecting dependent claim 29 in the Final Office Action, the Examiner merely stated that the “control circuit of Johansen et al. is capable of performing the functional limitations of claim.” *See* Final Office Action, page 7. As such, it appears the Examiner has merely asserted that because Johansen discloses a control circuit, the control circuit is necessarily configured to perform the actions recited by dependent claim 29.

However, this assertion is clearly insufficient to support a *prima facie* case of obviousness. More specifically, Appellants note that it has been held that an “adapted to” clause may be a positive limitation where it “states a condition that is material to patentability.” *See Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 USPQ2d 1481, 1483 (Fed. Cir. 2005); *see also* M.P.E.P. § 2111.04. With respect to the features of the control circuit recited by dependent claim 29, the features are clearly material to the patentability of this claim, and therefore should be construed as positive limitations. As

such, simply asserting that the control circuit of Johansen could be configured to perform the actions recited by dependent claim 29 does not support the assertion that the control circuit of Johansen is configured to perform the actions. Therefore, the Examiner has not met the burden required for a *prima facie* case of obviousness of dependent claim 29.

Furthermore, Appellants have been unable to identify any passages within the cited references that teach or suggest a control circuit configured to perform the recited actions of adjusting a speed of an electric motor based on a current position and a target position of a submarine device. Moreover, Appellants note that the Examiner has equated “moving or not moving of the valve” with “adjusting a speed” of an electric motor. *See* Final Office Action, page 7. However, Appellants contend that the fact that a valve is either moving or not moving cannot reasonably be interpreted as a “adjusting a speed” of an electric motor. More specifically, the mere fact that a valve is moving or not does not define an adjusted speed value of an electric motor that causes the valve to move.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “adjust a speed of the electric motor based on a current position and a target position of the submarine device,” as recited by dependent claim 29. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 29.

The Cited References are Missing Features Recited by Dependent Claim 30

Dependent claim 30 recites, *inter alia*, “the control circuit is configured to control the electric motor based on historical data associated with the actuation of the submarine device.” (Emphasis added.)

The cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “control the electric motor based on historical data

associated with the actuation of the submarine device,” as recited by dependent claim 30. Indeed, Appellants note that the Examiner has cited no passages in any of the references that teach or suggest such specific control circuit features. Rather, in rejecting dependent claim 30 in the Final Office Action, the Examiner merely stated that the “control circuit of Johansen et al. is capable of performing the functional limitations of claim.” *See* Final Office Action, page 7. As such, it appears the Examiner has merely asserted that because Johansen discloses a control circuit, the control circuit is necessarily configured to perform the actions recited by dependent claim 30.

However, this assertion is clearly insufficient to support a *prima facie* case of obviousness. More specifically, Appellants note that it has been held that an “adapted to” clause may be a positive limitation where it “states a condition that is material to patentability.” *See Hoffer v. Microsoft Corp.*, 405 F.3d 1326, 1329, 74 USPQ2d 1481, 1483 (Fed. Cir. 2005); *see also* M.P.E.P. § 2111.04. With respect to the features of the control circuit recited by dependent claim 30, the features are clearly material to the patentability of this claim, and therefore should be construed as positive limitations. As such, simply asserting that the control circuit of Johansen could be configured to perform the actions recited by dependent claim 30 does not support the assertion that the control circuit of Johansen is configured to perform the actions. Therefore, the Examiner has not met the burden required for a *prima facie* case of obviousness of dependent claim 30.

Furthermore, Appellants have been unable to identify any passages within the cited references that teach or suggest a control circuit configured to perform the recited actions of controlling an electric motor based on historical data associated with actuation of a submarine device. Moreover, Appellants note that the Examiner has equated the “last position of the valve” with “historical data” that may be used to control an electric motor. *See* Final Office Action, page 7. However, Appellants contend that the last position of a valve cannot reasonable be interpreted as “historical data associated with the actuation of the submarine device” insofar as the term “historical data” (i.e., as opposed to the term “historical datum”) suggests that more than one item of information is used.

Furthermore, there appears to be no suggestion in Johansen that a control circuit stores or otherwise is aware of the “last position of the valve,” much less that a control circuit uses this information to control an electric motor.

For at least these reasons, among others, the cited references, taken alone or in hypothetical combination, fail to teach or suggest a control circuit configured to “control the electric motor based on historical data associated with the actuation of the submarine device,” as recited by dependent claim 30. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 30.

C. **Ground of Rejection No. 3:**

As discussed above, the Examiner rejected claim 13 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher, and further in view of Ursel.

Claim 13 depends from independent claim 10. As discussed above, Johansen Dalton, Jr., Wallace, and Birtcher, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a housing having a control circuit disposed in a pressurized fluid, wherein the pressurized fluid is pressurized nitrogen, as recited by independent claim 10. Furthermore, it does not appear that Ursel cures the deficiencies of Johansen Dalton, Jr., Wallace, and Birtcher. More specifically, there appears to be no suggestion in Ursel relating to the use of pressurized nitrogen in a housing of a submersible actuator. Therefore, the cited references cannot render claim 13, which depends from independent claim 10, obvious. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 13.

D. **Ground of Rejection No. 4:**

As discussed above, the Examiner rejected claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher, and further in view of Schoenberg and Andre.

Claim 15 depends from independent claim 10. As discussed above, Johansen Dalton, Jr., Wallace, and Birtcher, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a housing having a control circuit disposed in a pressurized fluid, wherein the pressurized fluid is pressurized nitrogen, as recited by independent claim 10. Furthermore, it does not appear that Schoenberg or Andre cure the deficiencies of Johansen Dalton, Jr., Wallace, and Birtcher. More specifically, there appears to be no suggestion in either Schoenberg or Andre relating to the use of pressurized nitrogen in a housing of a submersible actuator. Therefore, the cited references cannot render claim 15, which depends from independent claim 10, obvious. As such, Appellants respectfully request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 15.

E. **Ground of Rejection No. 5:**

As discussed above, the Examiner rejected claim 28 under 35 U.S.C. § 103(a) as being unpatentable over Johansen in view of Dalton, Jr., Wallace, and Birtcher, and further in view of Ursel.

Claim 28 depends from independent claim 27. As discussed above, Johansen Dalton, Jr., Wallace, and Birtcher, taken alone or in hypothetical combination, fail to teach or suggest a submersible actuator including a container having a control circuit and filled with nitrogen, as recited by independent claim 27. Furthermore, it does not appear that Ursel cures the deficiencies of Johansen Dalton, Jr., Wallace, and Birtcher. More specifically, there appears to be no suggestion in Ursel relating to the use of nitrogen in a container of a submersible actuator. Therefore, the cited references cannot render claim 28, which depends from independent claim 27, obvious. As such, Appellants respectfully

request that the Board direct the Examiner to withdraw the rejection under 35 U.S.C. § 103(a) of dependent claim 28.

Conclusion

Appellants respectfully submit that all pending claims are in condition for allowance. However, if the Examiner or the Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: October 3, 2011

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8. **CLAIMS APPENDIX**

1.-9. (cancelled)

10. A system, comprising:

a submersible actuator, comprising:

a first housing having an electric motor disposed in a first pressurized fluid, wherein the first pressurized fluid is a pressurized lubricating liquid; and

a second housing having a control circuit disposed in a second pressurized fluid, wherein the second pressurized fluid is nitrogen, and wherein the control circuit is coupled to the electric motor, and the control circuit is configured to communicate with a remote control station.

11. (cancelled)

12. The system of claim 10, wherein the submersible actuator comprises another electric motor coupled to the control circuit, and the control circuit is configured to control the electric motors independent from one another.

13. The system of claim 12, wherein the electric motors are independently drivingly coupled to a drive shaft via a transmission, wherein the transmission comprises a transmission shaft, a worm screw coupled to the transmission shaft, and a sprocket coupled to the worm screw and the drive shaft, wherein the electric motors are coupled to the transmission shaft.

14. The system of claim 10, wherein the control circuit is configured to compare a value of a control signal with an average of a predetermined number of previous control signals.

15. The system of claim 10, comprising a membrane accumulator coupled to the submersible actuator and configured to balance internal and external pressures.

16. The system of claim 10, wherein the control circuit is configured to control the electric motor based on feedback indicative of a current absorbed by the electric motor.

17. (cancelled)

18. The system of claim 10, comprising a flow control mechanism coupled to the submersible actuator.

19. The system of claim 10, wherein the control circuit is configured to control a speed value and a direction for rotation of the electric motor based on a target shaft position and a current shaft position sensed by a position sensor.

20. A method, comprising:

pneumatically pressurizing a control circuit in a first enclosure portion of a submersible actuator, wherein pneumatically pressurizing comprises inertly pressurizing the control circuit in the first enclosure portion with pressurized nitrogen; and

hydraulically pressurizing at least one electric motor in a second enclosure portion of the submersible actuator, wherein the control circuit is coupled to the at least one electric motor.

21. The method of claim 20, comprising receiving an electrical control signal from a remote control station, processing the electrical control signal in the control circuit, and triggering the electric motor to actuate a submerged flow control mechanism.

22. The method of claim 20, wherein the at least one electric motor comprises first and second electric motors, and the method further comprises independently

controlling the first and second electric motors to enable independent actuation of a submerged flow control mechanism.

23. (cancelled)

24. The method of claim 20, comprising controlling the submersible actuator based on a target position, feedback, and historical data associated with the submersible actuator.

25. The method of claim 20, comprising controlling a speed value and a direction for rotation of the at least one electric motor based on a target shaft position and a current shaft position sensed by a position sensor.

26. The method of claim 20, comprising controlling the submersible actuator based on a first feedback indicative of an actuator position and a second feedback indicative of an absorbed current.

27. A system, comprising:

a submersible actuator, comprising:

a first container filled with a liquid;

a second container filled with nitrogen;

an electric motor disposed in the first container; and

a control circuit disposed in the second container, wherein the control circuit is configured to control the electric motor to actuate a submarine device.

28. The system of claim 27, wherein the submersible actuator comprises a worm gear coupled to the electric motor.

29. The system of claim 27, wherein the control circuit is configured to adjust a speed of the electric motor based on a current position and a target position of the submarine device.

30. The system of claim 27, wherein the control circuit is configured to control the electric motor based on historical data associated with the actuation of the submarine device.

31. The system of claim 27, wherein the control circuit is configured to control the electric motor based on feedback indicative of a current absorbed by the electric motor.

32. The system of claim 27, comprising a visual recognition device and a robot interface coupled to the submersible actuator, wherein the visual recognition device enables viewing of an actuation position associated with the submarine device, and the robot interface enables a robot to control the submersible actuator.

33.-35. (cancelled)

9. **EVIDENCE APPENDIX**

None.

10. **RELATED PROCEEDINGS APPENDIX**

None.